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Sustainable agriculture and farm animal welfare

2016

Farm Animal Welfare Committee
Area 5B, Nobel House,
17 Smith Square
London SW1P 3JR, UK

Contents

Scope

1. The Farm Animal Welfare Committee (FAWC) set out to review how farm animal welfare might be influenced by - and impact upon - the contemporary sustainable agriculture agenda and in particular, the new emphasis on sustainable intensification. This concern was in response to the significant amount of work on sustainability of food production that did not reference farm animal welfare in any detail. FAWC believes that animal welfare should be practically and effectively at the centre of the wider policy debate.

2. The study aimed to address how all the livestock sectors are responding to a perceived need for global increase in food production as well as protecting the environment and how this might impact on farm animal welfare. To this end, FAWC considered the influence of livestock producers, the supply industries (e.g. feed, energy, water, equipment, housing), the wider food chain (e.g. farm assurance, levy bodies, transporters, markets, processors, retailers and food service sector) and others with interests (e.g. NGOs, environmental groups, government, academia and veterinary bodies).

3. The Committee undertook a literature search and conducted written and face to face consultations. Members visited agricultural premises with systems relevant to sustainability, e.g. indoor and outdoor dairy, broiler chicken, farmed fish and pig systems. Members also received presentations about and saw in use Precision Livestock Farming techniques and whole farm approaches (such as energy and waste resource recapture systems).

4. While sustainable intensification, large indoor livestock systems and the increased emphasis placed on productivity by government and industry were some of the initial issues that drew FAWC into this review, it is clear that the current sustainability debate involves a highly complex matrix of policy and practical issues, many with existing and potential impacts on farm animal welfare.

5. FAWC recognises that this policy area is moving fast and may be influenced by changing priorities in the food production chain. FAWC strongly believes that sustainable agriculture cannot truly be achieved without the inclusion of the following key farm animal welfare principles in the policy making agenda. Animals are a key part of the agricultural system so animal welfare is crucial to achieve sustainable agriculture.

Animal welfare is integral to sustainable agriculture

i. Agriculture cannot be considered sustainable if it is achieved at an unacceptable cost to animal welfare.

ii. Sustainable agriculture must take account of the fact that farmed animals are sentient individuals[1].

[1] The sentience of farmed vertebrates is recognised by the European Union, the World Organisation for Animal Health (OIE) and national governments.

iii. Sustainable agriculture must include a duty of care for the physical and mental needs and natures of farmed animals, and should not depend on prolonged or routine use of pharmaceuticals, or on mutilations.

Context

Definitions

6. Approaches to sustainability have been strongly influenced by the interest in sustainable development over the last forty years, including its definition in the Brundtland Report, 'Our Common Future' (1987, pg 41) as "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*"

7. Sustainability requires consideration of environmental, economic, ethical and social aspects and their interactions. Societal priorities include an increasing, worldwide consensus that animal welfare should be protected and improved.

8. Sustainable agriculture can be defined as agriculture carried out in a way that meets the needs of the present without compromising the ability to meet the needs of the future. Discussion of this concept has been prompted in part by the perceived need to produce more food to feed a growing global population, while protecting the environment and reducing or preventing contribution to climate change. The emphasis has therefore been on the *production* of food, environmental services and social goods, but consideration also needs to address the *consumption* of these, as well as other factors such as losses and waste involved in production, sale and distribution and consumption.

9. Sustainable intensification has been defined as "*simultaneously raising yields, increasing the efficiency with which inputs are used and reducing the negative environmental effects of food production. It requires economic and social changes to recognise the multiple outputs required of land managers, farmers and other food producers, and a redirection of research to address a more complex set of goals than just increasing yield.*"[2]

10. In livestock farming, production under sustainable intensification may be limited not just by acceptability in environmental terms, but also by technological abilities and animal welfare.

11. Low intensity livestock farming systems exist widely and, while often perceived as sustainable or more natural, may have their own problems in economic, environmental and animal welfare terms (e.g. economic viability, increased emissions, reduced inputs and disease risk).

[2] Foresight (2011) Future of Food and Farming, GO Science

Animal welfare

12. The Five Freedoms developed by FAWC form a logical framework for analysis of animal welfare and have been used in policy and legislation around the world.

- **Freedom from hunger and thirst,** by ready access to fresh water and a diet to maintain full health and vigour.
- **Freedom from discomfort,** by providing an appropriate environment including shelter and a comfortable resting area.
- **Freedom from pain, injury and disease,** by prevention or rapid diagnosis and treatment.
- **Freedom to express normal behaviour,** by providing sufficient space, proper facilities and company of the animal's own kind.
- **Freedom from fear and distress,** by ensuring conditions and treatment which avoid mental suffering.

13. FAWC further maintains that all farm animals should have a life worth living, and that an increasing proportion should have a good life[3]. It is important to retain these concepts in the light of current developments towards sustainable agriculture.

14. Animal welfare is about the experiences of the individual animal but attention to these and the ability to address them may be lost in large groups of animals or in some farming systems, e.g. large poultry holdings and fish farms, where observation and treatment of the group becomes the norm[4]. The animal welfare impact of a practice or event depends on the numbers of animals involved as well as the intensity, duration and frequency of pain, distress or suffering. Hence, the ability (or inability) to reduce or prevent suffering is important in determining priorities for intervention.

15. Society places both ethical and economic value on animal welfare[5]. Good animal health and welfare has a strong link with good productivity and may also have beneficial influence on the environment, for example where increased efficiency of animal farming leads to reduced emissions[6].

16. Considerable work has been done on animal welfare indicators[7]. Examples of projects in this area include Welfare Quality, AssureWel, Animal Welfare Indicators Network (AWIN), Food Animal Initiative (FAI) and the Sustainable Intensification Platform (SIP). Some of the concepts of animal outcome measures derived from this work have become incorporated into farm assurance schemes such as Red Tractor, Soil Association, LEAF and RSPCA Assured. Animal welfare metrics should form part of any assessment of the sustainability of livestock farming and particularly novel systems.

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[3] https://www.gov.uk/government/publications/fawc-report-on-farm-animal-welfare-in-great-britain-past-present-and-future
[4] https://www.gov.uk/government/publications/fawc-advice-on-farmed-fish-welfare
[5] https://www.gov.uk/government/publications/fawc-report-on-economics-and-farm-animal-welfare
[6] https://www.gov.uk/government/publications/fawc-report-on-farm-animal-welfare-health-and-disease
[7] FAWC's 2009 Report on Farm Animal Welfare: Past, Present and Future

17. FAWC would encourage research to improve understanding and assessment of the emotional and behavioural states of animals as the next step in the evolution of welfare indicators. At present these aspects of animal welfare may not receive the attention they deserve because of limited validated metrics.

FAWC's past advice

18. In its letter to GB governments of 3 February 2012 on Agricultural policy[8] FAWC recognised the challenges in achieving balance between farming efficiency, competitiveness, food security, animal welfare and the environment, against the background of resource availability. The Committee expressed caution about use of the concept of sustainable intensification in relation to farm animals and recommended that:

- "*policies and mechanisms of sustainable intensification ought not to be pursued at the expense of current (or future) animal welfare standards;*
- *good husbandry practices and stockmanship must not be compromised or marginalised in the pursuit of greater production; and*
- *development of new technologies, land management techniques, building design and genetic procedures should place the welfare of farm animals at the centre of their considerations*."

19. FAWC further advised that "*in pursuit of sustainable intensification, production should not be promoted at any cost. The concept of sustainability must include the welfare of farm animals. Indeed, livestock agriculture cannot be considered sustainable if an animal's life is not worth living.*"

20. Also of relevance is the advice FAWC submitted to government in 2010 on the welfare of dairy cows housed all year round and/or in large herds[9]. This advice concluded that, given the highest standards of housing, management and stockmanship, and pending scientific research on the impact of year round housing on the fourth Freedom (to express normal behaviour), a standard of welfare may be achieved that, at a minimum, would meet legal requirements. Some of this behavioural research has been published[10] and other projects are ongoing.

Government policy

21. Government[11] has been investing significant time and resources into research and policy development relating to sustainable agriculture. A number of projects have recently reported or are ongoing, e.g. Foresight report - The future of food and farming 2011, Challenges and choices for global sustainability 2011[12], UK agricultural technologies strategy 2013[13], and the DEFRA-sponsored Sustainable Intensification Research Platform[14].

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[8] https://www.gov.uk/government/publications/fawc-advice-on-sustainable-intensification-of-livestock-agriculture
[9] http://webarchive.nationalarchives.gov.uk/20110909181127/http://www.fawc.org.uk/pdf/cows-welfare-letter.pdf
[10] http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=ProjectList&Completed=0&AUID=936
[11] Where we refer to "Government" we are addressing the Department for Environment, Food and Rural Affairs in England, the Scottish and Welsh Governments, the Northern Ireland Assembly and other responsible Government Departments and Agencies.
[12] http://www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-546-future-of-food-and-farming-report.pdf
[13] https://www.gov.uk/government/publications/uk-agricultural-technologies-strategy
[14] http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=18802

22. 'Creating a great place for living – Defra's strategy to 2020'[15] states the objective to create "*A world-leading food and farming industry*" with the associated aims of "*Improved productivity through innovation and enhanced skills*" and "*High standards of animal welfare and delivery for the environment*". The aim for high welfare standards is driven by an identified social trend of "*growing preference for local, healthy and high welfare food*".

23. Defra's single departmental plan 2015-2020[16] states that the department will "*push to incorporate high animal welfare standards into international trade agreements and reform of Common Agricultural Policy*" and "*press for all EU member states to ensure animals are only sent to slaughterhouses that meet high welfare standards*". A 25 year plan for Food and Farming is also expected in 2016.

24. The Scottish Government's stated overall purpose is "*to focus government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth*". To help meet this aim the Scottish Government funds a portfolio of strategic scientific research to support the development and delivery of rural and environmental policy, including animal health and welfare research[17].

25. The Scottish Government's current Animal Health and Welfare Strategy[18] recognises that caring for animals humanely is a public good in its own right and an essential part of sustainability in its widest sense (that is, including economic, environmental and ethical considerations).

26. The Well-being of Future Generations (Wales) Act 2015[19] came fully into force in April 2016. The Act requires public bodies, including the Welsh Government, to think about the long-term, to work better with people, communities and each other, to prevent problems and to take a more joined-up approach. The intention is to help create a Wales all want to live in, now and in the future. Well-being Goals and Principles provide a clear framework for government decision-making and will underpin everything the wider public service in Wales does in the future.

27. A Welsh Government consultation about a strategic framework for agriculture was launched at the Wales farming conference in June 2015. The purpose is to achieve a vision of a prosperous, resilient agriculture industry promoting Wales' present and future well-being. A key element in the successful delivery of the vision for the future of Welsh agriculture is partnership working between the farming industry and the Welsh Government contributing to the overall vision for sustainable growth in the agri-food sector.

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[15] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501709/defra-strategy-160219.pdf

[16] https://www.gov.uk/government/publications/defra-single-departmental-plan-2015-to-2020/single-departmental-plan-2015-to-2020

[17] http://www.gov.scot/Topics/Research/About/EBAR/StrategicResearch/future-research-strategy/Themes/Healthandwelfaretender

[18] http://www.gov.scot/Topics/farmingrural/Agriculture/animal-welfare/policies/strategy

[19] http://gov.wales/topics/people-and-communities/people/future-generations-act/?lang=en

28. The Welsh Government established its Animal Health & Welfare Framework[20] in July 2014. The Framework describes the long term vision for animal health and welfare in Wales through five strategic outcomes: "*Wales has healthy productive animals; Animals in Wales have a good quality of life; People trust and have confidence in the way food is produced and the way public health is protected; Wales has a thriving rural economy; and Wales has a high quality environment*".

Analysis

Impacts on farm animal welfare

29. There are many components of sustainable agriculture including: sustainable resource use; reduction of waste; reducing impact on environment; mitigation/adaptation for climate change; protecting rural communities. More specifically, sustainable intensification seeks to increase agricultural productivity and efficiency, to enhance the financial performance of farms and increase overall food production. Some of the people and organisations that FAWC consulted saw these drivers as requiring negative trade-offs with animal welfare but there is also the potential for improved animal welfare in conjunction with these objectives.

30. Concerns have been expressed about the impacts of the above on animal welfare. For example the Royal College of Veterinary Surgeons and the British Veterinary Association state: "*Changes in animal production and farming practices, and the growing need to provide affordable food to expanding populations between now and 2030, are likely to exacerbate tensions in terms of maintaining the highest standards of welfare for production animals. Pressures to increase efficiency and intensification of animal agriculture are growing at a time when animal welfare science is concurrently improving our understanding of animals' needs and preferences, and the extent to which their wellbeing could be compromised by management and husbandry practices.*"[21]

31. The following issues relating to sustainability of livestock agriculture have the potential to affect farm animal welfare, positively and negatively depending on circumstances:

a. Herd/flock size – Sustainable intensification is often understood in terms of efficiency gained from increased flock and herd sizes and larger husbandry units. There may be direct impacts on welfare: for example, group size affects social behaviour. Perhaps more importantly, there may be indirect effects, because factors such as stocking density and the number of animals managed by each stockperson may vary with farm size. The difficulty of addressing the welfare of individual animals in very large groups has been mentioned above (second principle and paragraph 14). However, large farms may provide potential advantages to welfare, for example through improving the professionalism of management, specialisation of staff, the ability to employ

[20] http://gov.wales/topics/environmentcountryside/ahw/wales-animal-health-welfare-framework/?lang=en
[21] RCVS and BVA (2015) 'Vet Futures' Report, pages 20-21.

a full-time veterinarian and opportunity to invest in infrastructure and facilities, particularly for handling animals safely (or when they are unwell).

b. Indoor housing allows for more refined management of the animal environment and resultant husbandry/stockmanship. However, it may compromise choice for the animal and restrict its freedom to express normal behaviour, e.g. zero or restricted outdoor grazing for dairy cows and permanent housing for poultry. Changes to the species being kept for production purposes, e.g. dairy sheep and goats, deer, ducks, etc. provide added concerns about the effects on welfare of any increase in intensification, regarding housing, management and disease. Attention should be paid to the difficulties of using old buildings for modern methods of husbandry and breeds of animals.

c. In any consideration of intensification, including simply increasing the number of animals kept indoors, use should be made of available metrics relevant to animal welfare concerns as well as production and environmental parameters. Further development of metrics relevant to farm animal welfare is required, e.g. in behaviour and emotional state.

d. Intensification is not just about increasing farm size or group size. Indeed, intensification can occur without increasing scale and scale can increase without intensification. Intensification may not even mean exclusively indoor housing but a more intensive use and management of land, buildings and other inputs. What is involved will vary between different countries, environments and systems. In itself, intensification may not therefore reduce animal welfare, but it may increase risk (e.g. from disease) and reduce the opportunity of a good life (e.g. by restricting behaviour). Intensification does, however, offer economies of scale increasing resources available for husbandry and veterinary care. The UN's High Level Panel of Experts on Food Security and Nutrition (2016)[22] recommends that stakeholders should support and improve '*animal health and welfare by promoting good practices and by establishing and enforcing robust standards for different species in intensive systems, building upon the World Organisation for Animal Health (OIE) guidelines and private sector initiatives.*'

e. Imported animal management systems can have positive and detrimental effects on animal welfare. These effects need to be considered when new systems are introduced, such as the dairy systems currently being introduced to the UK from New Zealand or North America. All elements of the new system being considered should be assessed for suitability in the various environments in the UK and to protect animal welfare.

f. Economics of production vary between livestock sectors and may affect the importance of animal welfare to food businesses. Farm viability, efficiency and profitability are important to a business pursuing sustainable production but

[22] HLPE, 2016. Sustainable agricultural development for food security and nutrition: what roles for livestock? A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2016. Full report forthcoming at www.fao.org/cfs/cfs-hlpe

also in providing the farmer with capacity to support animal welfare[23]; i.e. providing a margin for care.

g. Consumers – Informed consumer choice can drive demand for improved animal welfare. Economic success and sustainability of future livestock systems will depend in part on the willingness of consumers to purchase their products. To make this choice consumers need information on systems of production and the ability to choose at the point of sale.

h. Stockmanship is the key to livestock productivity and good animal welfare. Availability of good stockpeople, veterinary input and development of skills are even more important if animal group size and intensification increase[24,25].

i. Government and industry should investigate methods, including but not limited to EU Pillar II type funding, to encourage innovative approaches to the maintenance and improvement of farm animal welfare in sustainable agriculture systems. Government and industry should also keep the farming industry informed about the results of research into sustainable agriculture and technical developments that can assist the stockperson in their duties. There should also be resources to cope with emergencies and increased contingency planning activity to ensure this as previously set out by FAWC[26].

j. Precision Livestock Farming[27] and other new technologies may be developed that could have a major impact on animal welfare. The impacts of new technology can be beneficial, for example robotic milking increases the ability of the cow to regulate her own day and internal and external sensors can detect welfare and health conditions. New technologies should address the animal's needs rather than constrain them.

k. Technologies are being developed that will aid the stockperson to recognise potential animal health and welfare issues but animals will still require human intervention and care. Animals' welfare and behavioural needs should not solely be monitored by automatic systems but also regularly assessed by skilled and empathetic stockpeople.

l. Farmers should be reducing dependency on mutilations by innovation in system design and husbandry practices. Use of mutilations should not be considered without strong justification[28,29] and a system of farming should not have a dependency on specific mutilations. A review of currently permitted procedures should be undertaken by all Governments.

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[23] https://www.gov.uk/government/publications/fawc-report-on-economics-and-farm-animal-welfare
[24] https://www.gov.uk/government/publications/fawc-report-on-stockmanship-and-farm-animal-welfare
[25] https://www.gov.uk/government/publications/fawc-report-on-education-about-farm-animal-welfare
[26] https://www.gov.uk/government/publications/fawc-opinion-on-contingency-planning-for-farm-animal-welfare-in-disasters-and-emergencies
[27] Precision Livestock Farming - the use of advanced technologies to optimize the contribution of each animal
[28] https://www.gov.uk/government/publications/fawc-opinion-on-pig-mutilations-and-environmental-enrichment
[29] https://www.gov.uk/government/publications/fawc-report-on-the-implications-of-castration-and-tail-docking-for-the-welfare-of-lambs

m. Animal health – FAWC noted in 2014, "*current levels of endemic diseases in UK livestock are unacceptable and there is a need to prevent, eradicate and treat them more effectively*"[30]. Some sectors, with the assistance of sector animal health and welfare groups, are making progress against these problems[31], but there is still some way to go. Production efficiency and profitability can be increased by improving health status through active farm health planning and production management[32]. The UN's High Level Panel of Experts on Food Security and Nutrition (2016)[33] recommends that States and Intergovernmental Organisations should 'provide financial and technical support for improved animal health and welfare in agricultural development, including for capacity building programmes.'

n. Farm animal welfare relies on the availability of medicines for all kept species, given that even in the best kept flocks and herds there will be infections and conditions that require medication regardless of whether the specific farmed species is reared indoors or outdoors.

o. As the numbers of animals kept together increases, there are increased risks of infection or disease spread within a population. This is true for animals at high stocking densities in outdoor systems as well as in enclosed and controlled environments. As a consequence of increased infections, the amount of medication required to be used therapeutically on a per capita basis increases. Thus disease prevention becomes more important and with it the design of breeding, rearing and fattening systems to try and avoid large numbers of animals being affected by currently known infections or those that may emerge in the future. Some practices, for example gathering and mixing animals from multiple farms (e.g. young calves for rearing) can create higher medication dependency.

p. An aim of any sustainable farming strategy should be to remove the need for dependence upon any form of prophylactic medication at any stage of production. To that end any production systems that currently use, or contemplate using medication, should ensure that there is no inbuilt dependence on medication, e.g. system design problems masked by medication (or mutilations). Where an antimicrobial is used, it should be targeted and limited to effective therapeutic use to treat animals affected by a disease for which the use of an antimicrobial is indicated. The use of metaphylactic[34] administration should be limited. Vaccination, while a favoured method of disease prevention, should not be the prop for a system of production. There is also the potential with these treatments for microbial mutation to give rise to welfare problems as a result of compromised animal health.

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[30] https://www.gov.uk/government/publications/fawc-opinion-on-dairy-cow-welfare

[31] http://beefandlamb.ahdb.org.uk/returns/health-and-welfare/cattle-health-and-welfare-group-chawg/ http://beefandlamb.ahdb.org.uk/returns/health-and-welfare/sheep-health-and-welfare-group-shawg/ http://pork.ahdb.org.uk/health-welfare/pig-health-welfare-council/

[32] https://www.gov.uk/government/publications/fawc-report-on-farm-animal-welfare-health-and-disease

[33] HLPE, 2016. Sustainable agricultural development for food security and nutrition: what roles for livestock? A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome 2016. Full report forthcoming at *www.fao.org/cfs/cfs-hlpe*

[34] Metaphylaxis - treatment by medication of a group of animals to eliminate or minimize further expression or spread of a disease outbreak already underway.

q. Resistance to endo and ectoparasiticides is rising with potential for serious welfare impacts, particularly in outdoor systems and where intensification is considered. Similar considerations should be given to their use as to antimicrobial medications.

r. Creation and implementation of effective herd/flock health planning and biosecurity procedures can reduce disease and therefore costs to efficiency, productivity, animal welfare and the environment. Follow-up evaluation of why medication is used should be considered part of farm health planning. There is a need to match biosecurity for farms and groups of animals with protection of the welfare of individual animals.

s. Whole farm management - Farming has the potential for synergies in improved animal welfare, economics and environment through improved efficiency of the use of inputs and outputs, e.g. feed self-sufficiency, heat capture, energy efficiency and waste recycling to recover water, energy and nitrate. Recycled products can be used on the farm to animal welfare benefit, e.g. using poultry litter to heat the house, or resources may be freed up for welfare improvements.

t. Recycled by-products of brewing and baking are being used to supplement animal feed but there are few controls on the consistency and efficacy of these and other by-products. Precision farming, such as telemetry boluses to measure rumen pH can detect nutritional acidosis at a subclinical level not apparent to the stockman. Consideration should also be given to the extent to which farm animals are fed grains that could be fed to humans and the feed conversion ratios by which these are converted into food.

u. Sustainable intensification introduced through a planned whole farm approach can assist in reducing impact on the environment through increased control of inputs and emissions from the farming system but may result in increased confinement of animals. Indeed, trends towards keeping more animals indoors may also be driven by environmental concerns, e.g. reducing emissions, reducing soil erosion, reducing odour in the countryside and release of nitrate to the environment. It should also be recognised that housing animals is sometimes necessary to protect them from the effects of winter weather in some parts of the UK. It is important to note that while intensification of production may reduce pollution intensity (e.g. GHGs per kg of product), if it is accompanied by increased scale of production, total pollution may nevertheless increase.

v. Breeding - Advances in breeding selection and genetics mean that many animals have the potential for increased production, but this needs to be matched by the quality of management, stockpeople and the farming system. For example, a high genetic potential broiler may be unsuited for free range production and conversely a breed selected for extensive systems may do less well in an intensive environment. Selection for a broad balance of traits, such as robustness, health, productivity, efficiency, and reduced environmental

impact is preferable to selection targeted on one or few traits[35]. However, targeted selection for welfare advantage, e.g. avoiding dehorning by breeding cattle for polled traits, also has a place.

w. Industry should consider how far it is acceptable to change the telos of farm animals (for example, expression of behaviours fundamental to the nature of the particular animal – foraging, digging, grazing, walking, running), by breeding or mutilation, to improve productivity where there is a detrimental effect on the animal, e.g. on dairy cow fertility leading to high replacement rates[36].

x. Climate change - Concerns were expressed during consultation about changing weather trends increasing disease risk, perhaps through migration of vectors, and the dangers posed by increased risk of extreme weather events. While incorporating medium term environmental risk into animal welfare risk assessment can be difficult, it is important for all farms and farm sectors to have adequate contingency planning in place[37]. This was all the more evident in the catastrophic snow events of 2013/14 and flooding in 2014/15 and 2015/16.

Ethics

32. Ethical considerations (of both people and animals) have received less attention than the environment and economics, but are an essential part of the acceptability and applicability of sustainability policies.

33. Considering animal welfare and sustainability together can be difficult. Although some welfare-related issues, such as cross-generational herd health, breeding technologies and buildings investment, require the same medium- to long-term perspective as sustainability issues, welfare more often focuses on short-term harms and benefits to animals currently living. These can be difficult to balance against longer term gains and losses, which are less certain. Animal ethics is usually grounded in human acknowledgement of the sentience of other animals, while sustainability ethics typically places more weight on duties to other humans, including to those living in regions where the effects of climate change are greatest, and to future human generations.

34. Nevertheless, taking sustainability ethics seriously may indirectly promote animal welfare. Rather than entailing ever-increasing production to satisfy consumer demand, consideration of sustainability should call into question demand-led developmental models. The per capita consumption and production of meat and animal products would need to fall, or at the very least, the rate of increase in their consumption and production would need to reduce, if these are to be sustainable, especially in the context of a growing global population. In this context, governments have a role in influencing consumer behaviour.

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[35] https://www.gov.uk/government/publications/fawc-opinion-on-the-welfare-implications-of-breeding-and-breeding-technologies-in-commercial-livestock-agriculture

[36] https://www.gov.uk/government/publications/fawc-opinion-on-dairy-cow-welfare

[37] https://www.gov.uk/government/publications/fawc-opinion-on-contingency-planning-for-farm-animal-welfare-in-disasters-and-emergencies

35. Moreover, the ethical sustainability of farm animal production is itself part of general sustainability. Consumers may well be concerned about the welfare of the animals whose meat and products they consume. At least in the medium term, the ethics of how animals are farmed is likely to be, in both presentation and reality, an important business consideration.

Conclusions and recommendations

36. Policies relating to sustainable agriculture, and particularly sustainable intensification of livestock production, have the potential to impact on standards of animal welfare (and *vice versa*). Therefore, policy discussions on sustainable agriculture must include consideration of animal welfare.

37. FAWC strongly advocates that development of increasing production and efficiency in farm animal agriculture should not erode standards of animal welfare. These standards should continue to be informed by objective science.

38. All stakeholders in the livestock production chain should recognise that animal welfare is integral to sustainable agriculture. FAWC proposes the following key principles:

i. Agriculture cannot be considered sustainable if it is achieved at an unacceptable cost to animal welfare.

ii. Sustainable agriculture must take account of the fact that farmed animals are sentient individuals.

iii. Sustainable agriculture must include a duty of care for the physical and mental needs and natures of farmed animals, and should not depend on prolonged or routine use of pharmaceuticals, or on mutilations.

39. Management of livestock farming systems should aim:

- To ensure animal health; this should not be dependent on mutilations or prolonged/routine use of pharmaceuticals;
- To minimise pain, suffering and other negative states, and promote positive states such as comfort;
- To provide for animals' relation to their environment, including their interactions with people and their expression of normal behaviour.

40. Stockmanship is key to good health, welfare and productivity in existing and developing agriculture systems. As FAWC said in its letter of 2012, higher standards of stockmanship and management are required with increased intensification.

41. New technologies have the potential to assist in monitoring the health and welfare of farm animals but should not replace regular assessment of animals by a skilled and empathetic stockperson.

42. The industry should invest in professional training and motivation of stockpeople, including the potential impact of increased numbers of animals and interaction with new technologies.

43. Government should review currently permitted procedures carried out on farm animals.

44. Active farm health planning and production management can improve health status, production efficiency and thus profitability.

45. Industry and scientists, supported by Government, should develop further the application of the key principles detailed above through the use of on-farm input and animal-based outcome measures, or Key Welfare Indicators (KWIs). In order to protect and improve animal welfare standards in sustainable agriculture animal welfare metrics should form part of any assessment of the sustainability of livestock farming, particularly novel systems. Examples of KWIs might include mortality, membership of an assurance scheme and use of mutilations in the farming system together with key production parameters. Further development and validation of metrics relevant to farm animal welfare is required, e.g. in behaviour and emotional state.

46. Animal welfare can be improved by influencing farming system design. Moving away from farming systems that may harm animal welfare towards alternatives is important but may be difficult, requiring proof of viability and possibly inducement or incentivisation. However, development or import of new farming systems pursuant to the sustainable intensification agenda should be subject to rigorous assessment against animal welfare criteria.

47. Research results and related information should be available for livestock producers and others with interest in making sustainability work. Examples of top performing farms and those embracing technology and whole farm management with good standards of farm animal welfare should be disseminated to inspire others[38].

48. FAWC urges use of the precautionary principle where there is a risk of animals losing out to human needs. Where knowledge is inconclusive, the animal should be given the benefit of any reasonable scientific or moral doubt.

[38] https://www.gov.uk/government/publications/fawc-report-on-education-about-farm-animal-welfare

Appendix 1: Membership of FAWC – 2016

Peter Jinman - Chairman
Professor Michael Appleby
Martin Barker
Professor Henry Buller
Dr Andy Butterworth
Dr Joanne Conington
Richard Cooper
Mike Elliott
Dr David Grumett
Dr Carmen Hubbard
Richard Jennison
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Any enquiries regarding this publication should be sent to us at fawcsecretariat@defra.gsi.gov.uk